

Hobbies

WEEKLY

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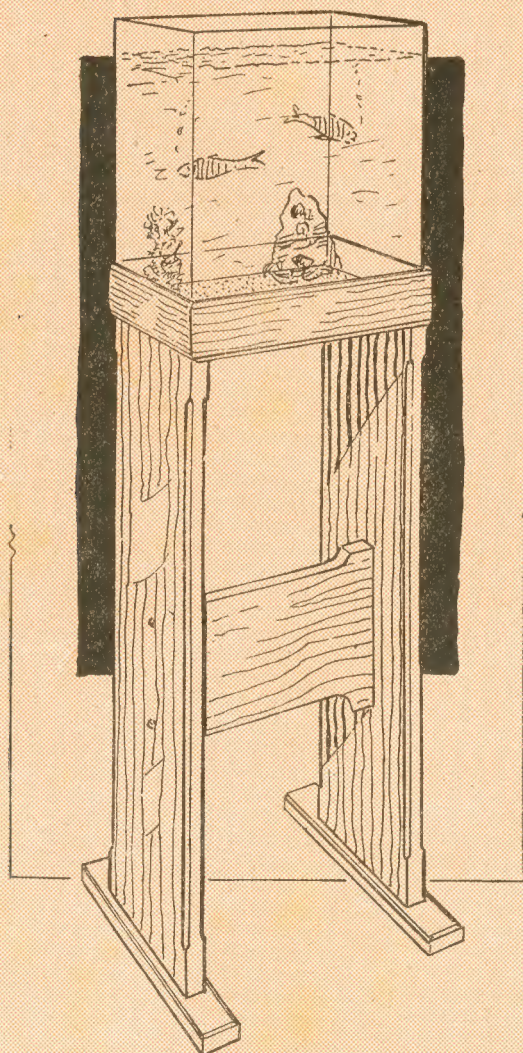
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A CHEAP STAND AQUARIUM



THOSE readers who have interest in aquarium life, an absorbing study, may care to make for themselves the very simple and inexpensive aquarium illustrated. Really it is a substantial stand, to hold one of the solid glass aquariums now on the market. There are several sizes of these, but the stand is designed to hold one measuring 8½ ins. by 14½ ins. which is quite large enough, for a start at any rate.

Of course, it is quite possible to use the aquarium without the stand, but it means sacrificing perhaps a side table, or something equally suitable, which may well be needed later on for another purpose.

The simple stand designed holds the aquarium at a nice height for studying its occupants, and also covers little floor space. Cleaning can be carried out underneath it without disturbing the fish, which is rather important. It may be mentioned here that the present cost of the aquarium is about 15/-, and as only a small quantity of

wood is used the total cost is unlikely to much exceed £1 or 30/-. Not a dear outfit, even for a slender purse.

The Wood Necessary

A side and front view of the stand are given in Fig. 1. A good quality deal will do for the timber, 1 in. thick and 9 ins. wide. From the board cut the two sides to length given, plus 1 in. extra for the bottom tenons. The sides can then be planed to the width given.

It will be seen on studying the outside dimensions of the stand that they are the same as those of the aquarium mentioned. It would be wise to purchase the aquarium first though and to measure it, then if any slight differences are apparent, the stand dimensions can be amended to conform to them.

The Cross Bars

At the bottom of the sides cut two tenons, 2 ins. long, and spaced 1 in. from each side. These sides are now to be joined together by two top cross bars, and one lower down. The top ones are 1½ ins. wide and are cut from the 1 in. thick board. They are jointed across with a single dovetail, as at (C) in Fig. 2. Dovetails are really easy enough to mark out and cut, but a plain tongued-and-slotted joint could be substituted, if preferred, as long as a pin is driven through the joint from the top to prevent any tendency to draw apart.

The cross bar lower down is cut from the 9 in. board. It acts as a stiffener to the stand, and is provided each end with two tenons, just ½ in. deep, and 2 ins. long. When cutting this bar to length do not

forget to add $\frac{1}{2}$ in. at each end for the tenons. The position of the cross bar is at 9 ins. up from the bottom, and in the

very accurately, and chisel these out $\frac{1}{2}$ in. deep. Make a close joint here.

Cut a centre bar, $1\frac{1}{2}$ ins. wide, and fit this across the top bars, as at (A), with a mortise and tenon joint. Before gluing up, fix the parts temporarily, and drive in (partly) round-headed brass screws through the sides into the tenons of the lower cross bar, as at (B), to draw the joint up tight. All fitting together satisfactorily, glue

A chamfer should be worked on the edges of the sides, as seen in Fig. 1, starting from 3 ins. up from the bottom and finishing the same distance from the top. This lightens the appearance of the stand. For the same purpose, the lower cross bar can have a little cut out from its width at top and bottom, as shown in the diagram, and look much better.

The Feet

The feet are 2 in. wide strips of the wood, cut to the length given in Fig. 1. In these the necessary mortises for the tenons on the sides must be cut through. Bevel the top edges, and glue the feet on. The aquarium should now, if placed in position, stand quite firm, but a rim must be added all round to keep it so.

For this rim, cut four pieces of $\frac{1}{2}$ in. thick wood, 3 ins. wide, and long enough to go round the four sides of the stand. Fix these in place with glue and nails to extend above the stand $1\frac{1}{2}$ ins. as in detail (D). The top and bottom outer edges of these rim pieces are bevelled a little. Ordinary butt joints will do at the corners, or mitreing for those who prefer a neater finish.

This completes the work of construction. Stain and varnish up the stand, then fit the aquarium in position, ready for its occupants. For this piece of woodwork an 8 ft. 6 in. length of 1 in. by 9 in. deal board will be needed, with just over 4 ft. of $\frac{1}{2}$ in. by 3 in. wood for the rims.

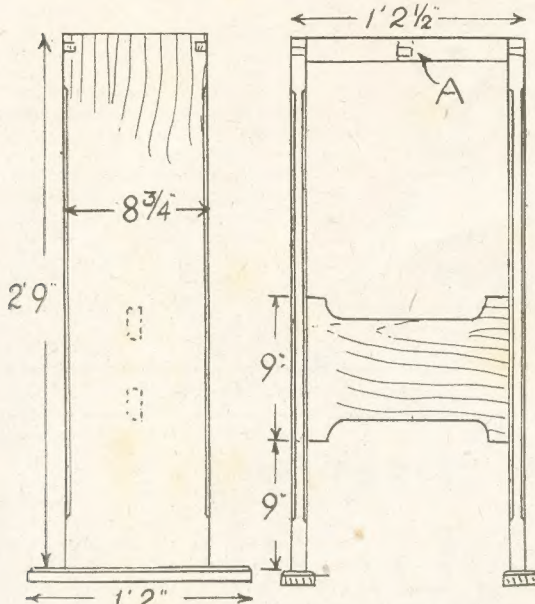


Fig. 1—Side and front view with dimensions

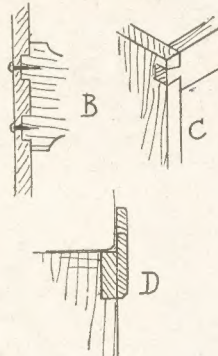


Fig. 2—Details of joints and construction

centre of the sides. Mark out the position of the mortises for the tenons

the joints, knock them well home, and drive the screws into the lower cross bar.

THE CRAFTSMAN'S NOTES—

How About Pipes?

ARE you trying to think of something a bit out of the ordinary to start collecting? Well, by the way of a suggestion, how about Pipes? Modern briars alone would keep you busy for a long time, short stems and long stems, smooth, rough, and bent, big bowls and little bowls, offering variety in plenty.

Then there would be cherrywoods to go at, an amusing example I have seen among this species having a 10 in. stem with a bowl shaped like a funny face. Then there would be another large assortment of clay's, not forgetting the long Churchwarden.

Meanwhile you could be enriching your collection with any earlier and rare specimens you can obtain, such as the ornate Meerschaut. You may even be able to include some of the peculiar types met with abroad. Egypt way, for instance, a favourite native fashion is to attach the stem to a tube passing through water. And if you can get hold of a Red Indian Peace pipe—well, your collection's getting somewhere.

Lagging the Boiler

A USEFUL little job you can do about the house, if it is not already done, is in connection with the hot water boiler.

Three or four layers of material should be wrapped around the boiler

and held neatly in place with pins or paste, or string. Corrugated paper does the job well and sacking is also satisfactory.

Even a good thickness of newspaper is better than nothing, finished off for the sake of appearance with a top covering of brown. The wrapping should cover as much of the boiler as possible.

The effect of this simple treatment is to help keep the heat in, so the water gets hot more quickly and the temperature is retained for a longer period after the heating apparatus is shut off.

The Early Birds

THE skylark always gets credit for being the early bird; at any rate, we talk about being 'up with the lark' when we are early out of bed. But it seems there is another bird been heard already astir and twittering while the lark is still snoozing—namely, the curlew.

Ornithologists make a careful study of birds to find out everything possible about their movements and habits, and in summer bird watchers everywhere listen for early morning bird sounds and report on the time and place as well as the weather conditions.

Observations made in June in a recent year reveal that the curlew was heard at 2.52 a.m. Next came the skylark at 3.10 a.m., then a redstart four minutes

later, followed by a swallow, pheasant, and cuckoo. The main bird chorus began round about 4 o'clock.

Plane Talk for Beginners

IF your wooden planes do not seem to run as smoothly as you would wish, try lightly dressing the sole occasionally with raw linseed oil. And do not set the blade too deeply; rather set it extra fine at first and adjust slightly if you find it does not cut.

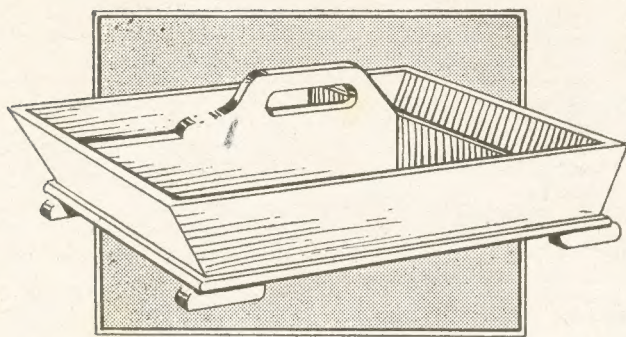
With smoothing planes one hand will be curved around the front and the other around the back, whereas with the jack plane the left hand (or right hand if you are left-handed) will rest across the front of the plane with the thumb on the near side and the fingers on the far side. Give yourself elbow room while working by not getting too close on top of the plane.

Slight extra pressure at the back as you start the stroke, slight extra pressure at the front as you finish—but for the most part apply firm even pressure with both hands.

In consideration for the cutting edge, which needs to be kept keen for good working, remember to lay the tool on its side during breaks from planing, and retract the blade into the body when putting it away for a time.

The Craftsman.

Use your fretsaw to make this sensible CUTLERY BOX



A REALLY well-made cutlery box is not only pleasing to make for one's home, but makes a very acceptable wedding gift or present for a friend. For home use a fairly cheap hardwood like beech or elm for example is a good choice. Deal of good quality and free from knots and shakes however, would answer equally well, but the finish to this wood is a little difficult to determine. American whitewood and mahogany too, are good woods to use, and they can be stained and finished in quite a professional manner.

The design given here provides for three compartments, the smaller one perhaps being set aside for spoons while the two larger ones are suitable for knives and forks.

Handle Shape

The rather unusual shape of handle coupled with the addition of fairly substantial feet impart to the box just that little out-of-the-ordinary effect which so pleases the eye. Stuff $\frac{1}{4}$ in. thick perhaps might be chosen when using the softer varieties of wood, while $\frac{3}{8}$ in. thickness would answer for the better qualities of wood.

The outlines of the ends and sides are shown at (A) and (B) in Fig. 1 while the centre division, with handle, is shown at (C) in the same figure. Draw the outlines of these parts on to the wood and cut round with a coarse blade fretsaw. Then clean up the cut edges with glasspaper. See the sloping ends of pieces (B) are identical by putting them together and checking them.

Grooved Fitting

Where shown on the end and side, form shallow grooves $\frac{1}{8}$ in. deep and in width equal to the thickness of the wood used. One end only, of course, will have a central groove, the cross partition having a similar groove to take the handle or long partition.

The ends of the side pieces (B) should now be reduced to about half its thickness to allow the ends of the box to be housed or recessed in to it as seen in the two details, Fig. 2. Take some care over

making these joints, for, simple as they are, they need to be carefully marked out and cut.

The cutting down can be done with a fine-tooth tenon saw and the waste wood cleaned away afterwards with the chisel. This method of cutting down will also be adapted for the cross grooves in the sides and cross partition.

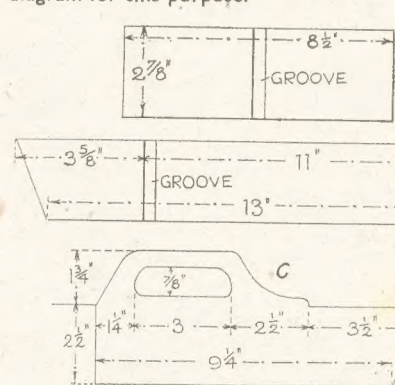


Fig. 1—Shape and dimensions of parts

The cross partition, not shown here separately, extends across the box, and to get its exact length, measure from groove to groove. When it has been set out and cut check in the grooves before actually gluing. It should be noted that the length of the cross partition is the same as that of the ends, and in the partition a groove will be cut centrally to receive the end of the handle partition.

Centre Partition

The handle partition, (C) Fig. 1 is next drawn out and cut. Note the handle extension piece at the top and its end shaping. There should be no difficulty in drawing the correct shape either direct on the wood or on to paper ready for transference by carbon to the wood. The full measurements shown should make the work easy for copying.

That part of the handle gripped by the fingers and all round the hand-hole should be neatly rounded off and shaped

and made smooth with glasspaper. Try out the partition in place for fit, but do not actually fix it until later on.

The Floor

The floor of the box can now be prepared, of $\frac{1}{2}$ in. or $\frac{3}{8}$ in. wood. Let the panel of wood extend $\frac{1}{8}$ in. or $\frac{1}{4}$ in. beyond the sides and ends of the box and allow for rounding the edges as shown. Fix the floor with glue and screws or wire nails. Take note that when driving the nails into the ends of the box they must be driven in at an angle corresponding to that of the ends themselves. This correctness of angle will be solved by holding the bradawl at the slope of the ends when making the holes for the nails.

Four corner feet will help the finished appearance of the box, and a detail of one is shown in Fig. 2. They may be any width from $\frac{1}{8}$ in. to $\frac{1}{4}$ in. and are glued and nailed on. If they are made fairly wide they will need extra support by adding short square or triangular fillets glued in the angle on the floor underneath.

The box can now be finished as

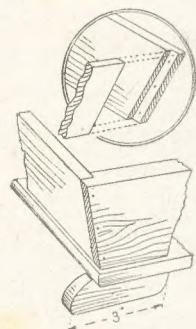


Fig. 2—The corner joint and feet

desired after the nails or screws have been well set down and the heads filled level and cleaned over with glasspaper.

If hardwood has been employed for making the box then it can be polished or varnished. The edges of the floor and the feet can perhaps be stained darker than the rest of the wood.

If softwood has been used, the whole could be given two coats of paint, each successive coat being rubbed down lightly with fine glasspaper before the finishing coat of paint or enamel is put on. Art shades of paint make for good appearance for such an article as this box.

The floor of the box inside should be covered with baize which must be cut accurately to fit close to sides, etc. and flat to the floor. It should be remembered to round off all the top edges of the sides and ends and make them properly smooth with coarse and fine glasspaper.

Make somebody happier by carrying out these HANDYMAN'S IDEAS

Portable Clothes Line

THERE is hardly anything in this but how useful it is! We simply take a long length of strong white cord, not too thick, and thread a dozen clothes pegs on it, passing the cord through the turn



in the wire spring. At each end tie a bowline. The bag, which will probably require the enlistment of feminine help, should have drawstrings, and, of course, be large enough to take the pegs.

Steel Wool is Useful

STEEL wool is a useful material for Shandymen, though its less obvious uses are not generally appreciated.

Except, perhaps, for the fine grade, one should always wear gloves when using this material, especially when pulling it from its packet. The writer has a friend who had a finger-tip completely cut off by a razor-keen strand of coarse steel wool—cut off as cleanly as a grocer cuts cheese with a wire.

An original idea is to get an old india-rubber (e.g. tennis) ball, large or small according to requirements, and cut it in half. One of these hemispheres is used to hold the steel wool without danger of cutting the hand.

At a hotel abroad, the writer saw men cleaning wooden floors by fixing a wad of steel wool to a shoe and working the foot back and forth over any stained places. Rubbing is done with the grain of the wood.

Steel wool, in general, is used in place of glasspaper, pumice, emery paper, and other abrasives. Apart from wood and metal it may also be used on glass, tiles, kitchen sinks, etc. On metal surfaces the wool is used wet, but on wood it is used dry.

Periscopes

THE Festival of Britain may be some months ahead yet, but it is not too

early to think about making periscopes to watch (over the heads of six-footers in front of us) the various processions and festivities that will take place in London and in the provinces.

The periscope is merely a long box with a mirror top and bottom. Both mirrors, one of which has an opening outwards and the other inwards, slope at 45 degrees, and both face each other. The top one reflects the view, and the lower one reflects the top one and consequently the view as well (see Fig. 1.)

You can make the periscope any height—as high as a house if you like—but the taller they are (the bulkier they are to carry, and the more tiring to hold. In Fig. 2 the artist has used a conventional 'break'. This does not mean that the material is to be cut in two parts, horizontally, but merely that, to save space, the drawing has been shortened. The case, as made up, will appear as in Fig. 3. 2ft. high is a suitable size, and the mirrors can be $3\frac{1}{2}$ ins. by $2\frac{1}{2}$ ins. Any glazier will cut these for you quite cheaply.

For the case, it is a good plan to buy a sheet of stout strawboard in a stationer's rather than rely on cardboard from old boxes, etc. There is no reason why the case should not be made in plywood, aluminium, or even light sheet metal.

Cut to the sizes indicated in Fig. 2 and 4. You need one main case, and two mirror supports. The former is merely a plain box 2ft. by $3\frac{1}{2}$ ins. by 2ins., with 'windows' cut out as shown. The latter are triangular boxes, to the sloping faces of which the mirrors are bound by means of rubber or paper bands. Score all lines with a penknife before bending. Rubber bands will hold the parts whilst the glue is drying.

Smear some glue to the back of the mirror supports, and push them into the box so they stay there. The bottoms of the mirror supports thus become the top and bottom of the main case. The mirrors slope away from the openings, and by looking in the lower mirror your line of vision should be raised about two feet.

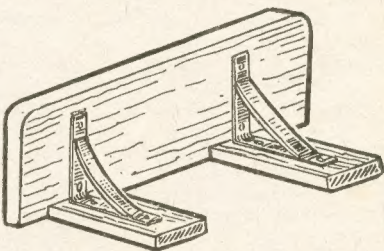
Bind all edges with stout gumstrip or passe-partout tape, and then cover the case with either plain brown paper, or, better still, leatherette paper.

Make several of these, not just for yourselves but for friends and relations. They should sell well, too.

Ready-to-Fix Shelves

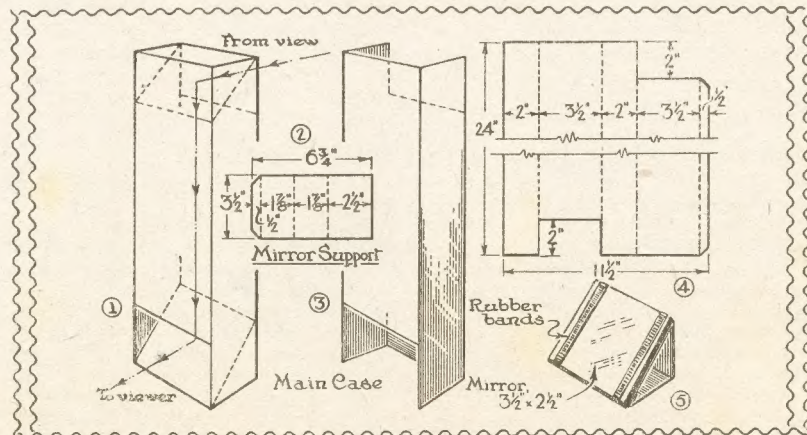
HERE is an original idea for a handicraft article for sale. Supply ready-to-fix shelves. The sketch shows the idea. The brackets are already screwed to the shelf and blocks, and these blocks are already drilled to take the screws for fixing the shelf to the wall.

The safest way to fix the shelf on the wall is to use fibre wall-plugs. You can



either charge a price which includes fixing free, or charge extra to fix the shelf where the customer wants it.

Shelves can be made in all sizes, the larger ones having three brackets. Do not forget triangular corner brackets. You might suggest to prospective customers that you will make a shelf 'to measure'.



Radio constructors will be glad of these notes about TRANSFORMER COUPLINGS

THE different types of transformers in common use seem to present difficulties to some readers. This most important component should always be employed correctly, or poor results may be caused. In both mains and battery receivers transformers may be used for coupling the valves. A suitable speaker transformer, suitably connected, is essential, while some types of microphone cannot function properly unless a transformer is wired in circuit. Thus errors may easily be made and reproduction spoiled.

Between Valves

Transformers are often used to couple one valve to the next and the most popular transformer for this purpose is shown at (A) in Fig. 1. The shape and

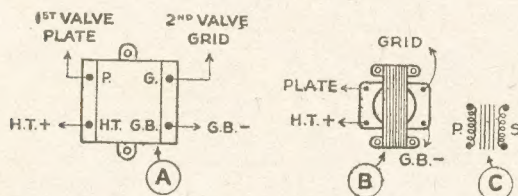


Fig. 1—Directly coupled transformers

size of the component may vary, and in some cases the relative position of the terminals will be changed, but all such transformers are normally marked 'P', 'HT', 'G' and 'GB' and these terminals must be connected up as shown.

The best secondary connections to some extent depend upon the receiver circuit. If there is any tendency towards uncontrollable howling, the effect of reversing the secondary connections should be tried. That is, take 'G' to grid bias and 'GB' to the valve grid. (This reverses the phase of the signals in that part of the circuit following the transformer.)

Some transformers are not enclosed in a bakelite case and may have soldering

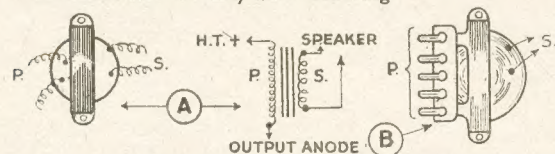


Fig. 3—Loudspeaker transformers

tags only. These are used in just the same way.

Small or old-fashioned transformers may merely have 'P' by one pair of tags or terminals and 'S' by the second pair. This stands for Primary and Secondary. The leads should be connected as shown at (B) in Fig. 1, secondary connections being reversed over if necessary, as explained.

Locating Connections

Each such transformer has two wind-

ings, the primary and secondary, as shown at (C) in Fig. 1. No connection exists between the two windings. (The lines between them indicate the iron core.) If a transformer with no markings, or with coloured leads, is to hand, tests for continuity can be made between the various ends. This will show which pairs of leads or tags are connected internally by the windings; one pair will be the primary, and the second the secondary, connections. If a meter is available, test the resistance of the windings. The lowest (about 2,000 to 5,000 ohms) will be the primary, and the other (about 5,000 ohms upwards) the secondary.

Because of the high resistance of the windings these tests cannot be performed with a battery and bulb, but a small dry cell and headphones can be used. The

of the valve passes through the 50,000 ohm resistor. Signals pass through the .05 mfd. condenser and to the primary of the transformer. However, no direct current needs to pass through the latter and because of this many small transformers will give best results when used in this way.

Leads

A transformer of the type shown in Fig. 1 can be used. Transformers especially intended for feeding in this way are usually marked differently, 'C' being used for the condenser point, and 'E' for the earth, or H.T. negative, connection.

Some such transformers only have three terminals or leads. Here, the 'E' end of the primary is connected internally

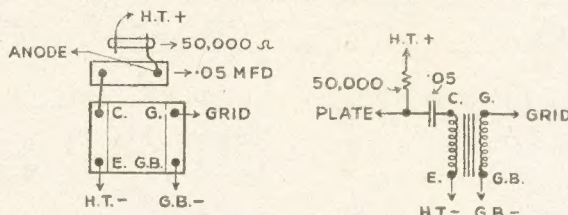


Fig. 2—Parafed transformers

phones will click most loudly when the current is passing through the primary.

Do not connect up a transformer with unknown connections at random because if one winding is taken to G.B. negative and H.T. positive the current flowing will destroy the fine wire inside the component. If no connection is found to exist between one pair of tags then the winding has been burned out or has corroded and the component cannot be used as it stands.

If the bobbin is so made that the ends of the leads (which will be soldered to the windings themselves inside) can be seen, then normally connections will be

to the 'G.B.' end (which is virtually the same as earthing the winding), and so no connection to the H.T. negative line is required. The coupling condenser should have good insulating properties, so a mica one is best. Any value between .01 and .1 can be used, though .05 is generally a little the best.

Speaker Transformers

Moving coil speakers cannot have many turns on the speech coil. Their impedance is consequently low and an output or speaker transformer must be used to couple them to the output valve in the receiver, as shown at (A) in Fig. 3.

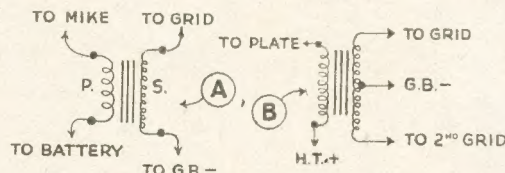


Fig. 4—Microphone and push-pull transformers

as follows: end nearest centre of bobbin is 'P' (A) in Fig. 1; next lead, slightly outwards, is 'H.T.'; third, slightly farther from core centre, is 'G.B.', and the outermost, near the edge of the bobbin, is 'G'.

Parafeeding Transformers

Midget or very small transformers are wound with such very thin wire the primary cannot carry any current and these should be connected as shown in Fig. 2. Here, the anode or plate current

In such transformers the secondary consists of only a few hundred turns of fairly thick (about 22 S.W.G.) wire, and it can therefore be easily distinguished from the primary (consisting of several thousand turns of thin wire).

Different valves function best with different anode impedances. Therefore some speaker transformers have tappings so the number of primary turns in sequence can be modified. Such a component is shown at (B). If used, it is merely necessary to try taking leads to

the various tags to determine which give best volume and quality of reproduction. With battery pentode valves, the full winding will normally be needed (outside tags). Battery triodes or mains pentodes will require less turns, and the centre and one outside tag can be used.

With push-pull circuits, take the centre tag to H.T. positive. One valve anode will go to one outside tag, and the other valve anode to the other outside tag, thus providing equal ratios each side for each valve anode. The ratio of such transformers is normally between about 20 and 80:1.

The exact ratio for any particular valve and speaker can be found as follows: divide the optimum load of the valve by the speech coil impedance and determine the square root of the result. This is the correct transformer ratio.

Microphone Transformers, etc.

Carbon microphones must have a transformer permitting a constant current to flow, and such a component will have a low-resistance primary, as shown in Fig. 4 at (A). (Actually, a

speaker transformer with secondary employed as primary is quite useful here.) A step-up ratio of about 1:50 or 1:100 is usual in such transformers. (The second microphone connection is taken to the remaining battery tag, a switch being included to stop the current when the apparatus is not in use.) No carbon microphone can function properly without it.

Where a coupling transformer for use between valves has three secondary terminals or tags it is intended for push-pull operation, the centre tap going to grid bias negative. This can, if desired, be used with a single output valve by ignoring the second grid terminal.

Alternatively, if the grid bias connection is taken to the latter, instead of to its centre tap, the ratio of the transformer will be doubled. In a few cases the primary of such transformers may be intended for parafeeding, as in Fig. 2.

Transformer Ratios

Most intervalve transformers (those intended for coupling between valves) have a ratio of about 1:3 to 1:5

step-up. For various reasons higher step-up ratios are rather impracticable, though ratios of up to 1:10 may occasionally be found. It will be found that the ratio, here, does not have much effect on the results obtained. Normally, any ordinary coupling transformer can be used, whatever its ratio.

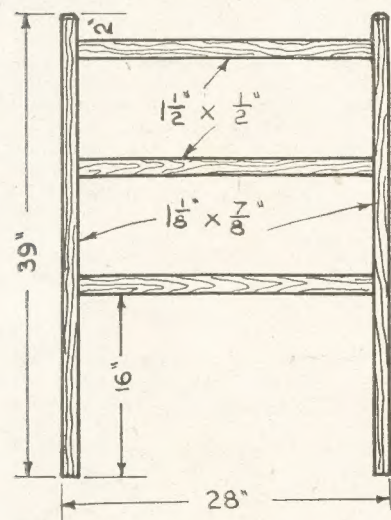
With Triode Valves

With triode valves, an output transformer does not need to be very critically adjusted, but with pentode valves the ratio is fairly critical. Here, a ratio that is too low will cause loss of volume and slight distortion in reproduction. Accordingly, always adjust the output leads to those tapings giving best results.

If no alternatives are available, as at (A) in Fig. 3, the transformer is intended for one particular class of output valve. It will work with others, but not quite as well as would a transformer with the correct primary impedance. A tapped transformer is therefore usually much more useful for the experimenter.

There are several special things to know in making A CLOTHES HORSE

THERE is hardly a family household where a clothes-horse is not required at some time or other. It is a piece of equipment which never goes out of fashion. There is always need, after washday is over, for somewhere to place small items of clothing;



whether to complete the drying process, or after the ironing has been done.

If your present clothes-horse is looking the worse for wear, or you need an extra one, why not have a go at making one yourself with the aid of these instructions and the accompanying sketches?

A clothes-horse is simply a pair of frames hinged together. Some are hinged

with ordinary metal butt hinges, but the most popular method is the cloth or webbing hinge which allows the frames to be opened in either direction. This is convenient, and causes no delay when setting up the clothes-horse. If, however, metal hinges are used, screw a pair of 1 1/2 in. butts to the back of the hinge uprights.

Frames

Frames are each made of two uprights 39 ins. long by 1 1/4 ins. by 3/8 ins., joined by three cross rails 28 ins. long by 1 1/2 ins. by 1/2 in. The ends of the rails are cut down to 1 in. wide tenons, 1 in. long, centrally, to fit 1 in. by 1/2 in. mortices in the uprights. The top edges of the rails should be rounded off, and the top ends of the uprights chamfered.

The positions of the rails are shown on the drawing. The lower rail is 16 ins. from the floor, the top rail is 2 ins. from the top, and the middle rail centrally placed. The positions can be arranged to suit individual requirements.

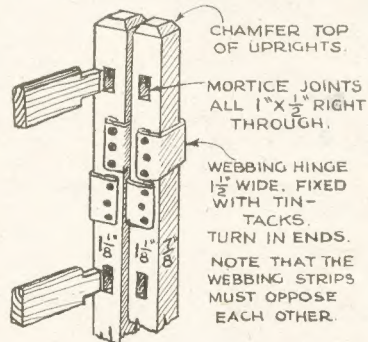
As it is practically impossible to obtain deal, the sizes of the material are arranged to suit hardwood, preferably straight-grained beech. If deal is available, however, increase the width of the uprights by about 3/8 in. for extra strength at the joints. For the same reason, it is not a bad idea to make the mortices and tenons with rounded corners, instead of cutting them square.

Glue and Hinging

Take off all sharp corners left from planing and glasspaper all the strips before fitting together. The joints can

be glued, preferably with waterproof glue, and also pinned through with thin 1 in. nails having small heads. Clean off the ends of the tenons.

Hinges are simple to fix if the two frames are tied together with string first. The pieces of webbing can then be



slipped between the hinge uprights. Turn in the ends of the webbing before fixing with tin-tacks, and make sure that the pieces are pulled up tight.

Four pieces will be required, each 5 1/4 ins. long, two for the top and two for the bottom hinge, just below the top and bottom rails. Make sure that the pieces of webbing are opposed to each other in pairs as seen in the diagram, otherwise the hinges will not function correctly.

As the cross rails will have to take the weekly wash no finish must be applied. Perhaps a coat of clear varnish on the uprights alone would add a final professional touch to a really useful article.

(217)

The first of two practical articles on STUFFING BIRDS

THE craft of taxidermy, to give the art of stuffing and mounting birds its proper name, is one that can be learnt reasonably easily. Once the elements are known, skill comes quickly with more and more practice. It is a fascinating craft, and none gives more delight when the finished article is nearing completion—for there is a peculiar attraction in a finely-mounted specimen, and each new one is unique.

A steady hand and patience are two essentials, and if the newcomer to the craft has an interest in birds and animals in their natural state this will be an added advantage. When the stuffing of the subject has been completed a good mounting depends largely on the ability of the taxidermist to give the model a poise which is, above all, natural. The nearer it comes to resembling a natural study of the creature concerned the finer model it will be.

Choosing Early Subjects

While it is more easy in many ways to handle animals, there are two good reasons why it is advisable to practice with birds at first. Birds are normally easier to procure, and most people are more familiar with them in their natural state than with a very great variety of animals.

It is suggested that the specimens be shot with the smallest of ball shot, thus ensuring as little damage as possible. Many of the smaller birds, such as finches and tits, have such fine skins that the apprentice would be wasting his time in attempting to skin them.

As a general rule it is wise to remember that birds which feed on a variety of fare usually have fairly tough skins, while those which are chiefly seed- or insect-eating are usually fine-skinned. Most birds of prey, but not all, have fairly thick skins.

A Simple Start

One common bird in particular is recommended for the beginner: it has a tough enough skin for less nimble fingers, and is far more pleasing when seen close to than when foraging or perched on a chimney. It is the starling, whose feathers have a fine purple sheen and most delicate whorled markings in many colours.

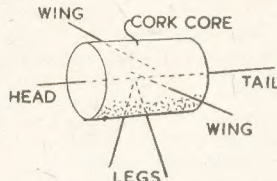
Skinning the Specimen

Work is best begun on skinning the bird as soon as it is cold. It is not wise to delay this part of the proceedings because of the setting-in of *rigor mortis*, when the body stiffens, and also because of the onset of decay.

One cut only is made in the skin, from the throat to the anus. When this is done, commence peeling the skin away from the flesh along the length of the cut. Few tools are needed for taxidermy, but

a small pair of scissors, a mustard spoon, and a sharp penknife are essential. Work the skin away from the flesh until it is completely free of the body except at the head, tail, wings and legs.

Deal with the joints at the tail, wings and legs next, leaving the neck until last. Work the skin as far as possible at these points, and then sever it carefully. The knife will be needed to cut the strong tendons at the wings and legs. Clean all these points well, as it is most important that no flesh is left on the skin. Any



How wire and cork are fitted

small holes that are made will have to be repaired later.

Lastly, sever the neck at the base of the skull, scooping out the brain and eyes with the aid of the small spoon and point of a knife blade. Go over the skin while it is still damp, removing any bits of flesh which may still be adhering to it. Then wash it carefully with a little cotton wool and soap and water, taking care not to wet the plumage.

Curing the Skin

For the next stage some arsenical paste is required, and this can be procured from a chemist if its use is stated. When the skin is reasonably dry, paint the inside of it with a thin coating of the paste, using a fine brush. Make sure the whole skin is treated, paying particular attention to the skull.

It should be draped over a cup or similar object to dry when this has been completed. It is not advisable to pin out the skin, as this will damage it.

Stuffing the Skin

For the stuffing of the specimen wires

and corks of various sizes are needed. These are quite cheap, and can be bought from a professional taxidermist (names on request to the Editor). The cork forms the central core of the body of the model, and should be chosen by size accordingly. The wires, when fitted to the cork, must be cut off at the required lengths.

Wire Skeleton

Fig. 1 shows the skeleton which must be aimed at in constructing the cork and wires, and only the wire from head to tail pierces the cork right through. Those for the wings and legs should only be fixed firmly into the cork. For larger specimens stronger wires should be used, and in these cases all the wires may pierce the cork.

When the skeleton is complete force the front wire well into the skull, packing it tightly with cotton waste or tow, using the small spoon. Next, deal with the tail wire, embedding it into a small ball of the cotton waste plugged into the skin at the tail.

The wing wires are dealt with in a similar way, but the leg wires must be forced through the legs to emerge at the ball of the claw and left to protrude. The last point is important, because these are used in the mounting. When all the wires are in place, build up the body to life-size with cotton-waste, keeping the cork in a central position.

Sewing Up

Lastly, sew up the skin carefully with fine thread, using the smallest possible stitches. Imitation eyes, with a small fixing wire attached, can be obtained from the taxidermist. These should be given a coating of glue when plugged into the cotton waste at the eye sockets. A gentle squeeze at this stage should be sufficient to give the body of the model its final form. The wings and legs can be adjusted later by their wires, and also the poise of the head.

The next article will deal with the mounting of the specimen. (239)

Television Aerial

PLEASE send me details for the construction of a television aerial. (A.C.T.—Cowley).

A HALF-WAVE dipole is the usual Aerial used, and for the London transmitters a length of 10·4ft. will give resonance approximately between the vision and sound transmitters. (In some cases it may be desirable to obtain maximum efficiency on vision frequencies; if so, the length of the aerial will have to be modified by experiment to find most suitable dimensions). Aluminium tubing of about $\frac{1}{2}$ in. diameter

is the most suitable material. Two 5·2ft. lengths may be clamped by insulating material at the centre and leads taken from the inner ends. It is also possible to use two 5·2ft. lengths of stout wire, supporting these on a lath about 11ft. long with stand-off insulators. From inner ends of wires or tubes the twin lead-in is taken. This must be at rightangles to aerial for at least $\frac{1}{4}$ th wavelength, and coaxial cable or transposed wires will be used according to receiver. Feeder cable should for preference be any length which is an odd number of multiplications of the transmitter wavelength.

The handyman should be able to undertake these DAMP HOUSE REPAIRS

ADAMP house is unhealthy and unpleasant; furniture and wall-paper may be ruined, and the floor boards may contract dry rot. The home handyman can do much to cure dampness in the house, and so prevent these ill effects.

Moisture can enter the inside of a house from three main directions—from the ground, through the walls or through the roof. Bricks and most building stones are porous, and hold a considerable amount of water, while they can lift up moisture from the ground by means of capillary attraction. Houses built on heavy land, like clay, are more likely to be damp than those on porous rocks, like sand.

Damp Course and Ventilators

Most houses have a damp course of non-porous material such as slate inserted between two layers of bricks above ground level, to prevent moisture from being drawn up from the earth into the house. The absence of a damp course is a serious defect, and is expensive to remedy. This is a job for the builder.

Make sure that the ventilators are not obstructed by leaves or earth, as this would prevent a drying current of air from passing beneath the floor. Perhaps in your gardening enthusiasm you have heaped the soil above the level of the damp course, thus allowing moisture to enter.

Re-Pointing

When it rains, the walls of the house become thoroughly wet, and this moisture may seep through to the inside. The cause may be that the mortar between the bricks has become perished. The walls should then be re-pointed by scraping out the old mortar and replacing with fresh.

This is a job any handyman can do. Make the mortar of two parts cement and three parts sand, and thoroughly wet the cavity before applying the new mortar.

The bricks themselves may have increased in porosity due to age. There are several methods of reducing this porosity and preventing access of water. One old method is to coat the outer wall with tar. A more modern method is to use cement paint, which is easy to apply, and extremely effective.

Downpipe Defects

There are also proprietary liquids which fill in the pores of the bricks without altering the colour of the wall. Any builder's merchant can supply these. Ordinary water-glass (egg preserver) is effective, too, if you apply several coats of the diluted liquid.

Walls which do not allow penetration of water from an ordinary rainstorm cannot, however, withstand the con-

stant gushing of water from a leaky gutter or drain pipe. Watch out for these defects, and put them right before blaming anything else. Drain pipes which overflow from the top may have a bird's nest lodged inside somewhere. This will be a job for flexible rods of the type used for chimneys and drains.

Faulty window frames allow water to enter, and cause damp patches underneath the window. Fill all cracks in the woodwork with putty, and renew any perished cement. Badly rotted frames should be replaced.

Roof Repairs

Rain can enter through broken tiles or slates in the roof, and at the place where a chimney stack joins the roof. The latter region is protected by a lead flashing, but if this is defective, leaks will occur here.

Similarly, at the junction between a roof and a wall, flashing is used, and may be at fault. Unless you are keen on 'mountaineering' over roof tops you

should get a builder to do the job.

Make an expedition into the region just below the roof, and inspect for loose or broken slates. A temporary repair to a small hole in the roof can be effected by sticking a piece of roofing felt on to the underside of the slate by means of one of the adhesives sold for such purposes.

Interior Walls

If you cannot find the source of the damp which is entering your house, or are unable to take any action to cure the defect, the next best thing is to coat the interior walls so that wallpaper and distemper can be used without discolouration taking place. Various preparations are sold for this purpose. Much depends upon the type of surface on which you wish to use these products, and it is best to seek the advice of the stockist.

A final word, now is the time to go to war against the damp; do not leave it until the winter sets in. (242)

A Complete Island Model

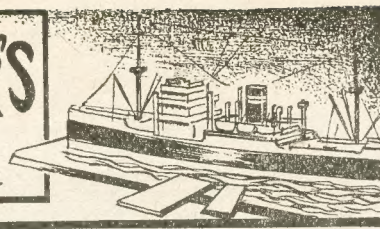
FOLLOWING our article recently suggesting models of areas and districts Mr. Eric L. Richardson of Brentwood Avenue, Whitley Bay sent us this picture of a similar model he had completed at his first attempt. Many readers may recognize it as St. Mary's Island and Lighthouse—a prominent feature of Whitley Bay. Those in the district should take an opportunity of seeing the model which will be on exhibition at the October show of the Tyneside Society of Model and Experimental Engineers. It is built to a scale of 16ft. to an inch, which means that the overall size of the base board is 30ins. by 20ins. and the tower of the lighthouse is approx. 8ins. above ground level. The contour and shape of the island were cut out of 1/4 in. thick wallboard. The tower is made of discs of the same material with a hole running up the centre to give passage to the wire to the 8-volt bulb in the lantern. By means of a bell transformer this is lighted from the domestic circuit and a "flasher" incorporated simulates the flashing period of the prototype. A coating of Pyramu cement was given to the wallboard, and marks cut in the surface to imitate the rocks and the surface of the sea was also worked up in Pyramu. Poster paint was used over the whole model. A certain amount of grass grows on the island and this was achieved on the model by using model maker's green flock. The houses were constructed of cardboard, although it would have been easier and just as effective if they had been made solid from blocks of wood, balsa, say, for ease of writing.



(Photo by courtesy of the Shields Evening News)



The SHIPMODELLER'S Corner



Perfect deck work makes all the difference

THE first item that attracts the attention of the expert when viewing an amateur-made Ship Model is the deck; usually it is quite flat. This was never the case on sailing ships, the decks always being crowned. That is, given a camber from the centre to each side. This was done in order that any

sides to simulate the waterways. Or better still cut them to the correct curve from thin veneer and glue in position. Make them $\frac{3}{16}$ in. wide on the small models and $\frac{1}{4}$ in. on the larger models.

Deck Planking

After this is completed, deck planks must be ruled in scale. For the smaller models (Golden Hind, etc.), make them $\frac{1}{16}$ in. apart and for the larger $\frac{1}{8}$ in. apart. This will give slightly over scale planks, but it is the smallest practical and gives the right effect at this scale.

Now give your deck a coat of shellac and allow to dry. When dry mark out the position of deck houses and hatch covers. When ruling your planks leave a

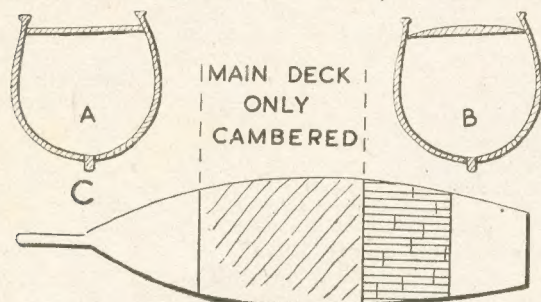
margin around each hatch or deck house, about the same width as your planks. Having pencilled in your deck markings take a single edged razor blade and metal ruler and score in each line about $\frac{1}{32}$ in. deep.

Now take a tube of artist's oil colour, burnt umber, and some turps and paint

Get better results by following these notes

by 'Whipstaff'

the whole surface of the deck. This done, take a clean rag and wipe off all the paint evenly. This method will leave your deck a rich warm colour, and as the paint will be left in the scored lines, it will show up very well, simulating the caulking between the deck planks in a very realistic manner. A point to note is that, as deck planks do not, of course, run the whole length of the ship, nick across your planks, staggering your cross cuts to avoid monotony of effect, as in the diagram.



water falling on deck would strain away to the scuppers. (See diagrams A and B).

Let us then make a deck for our model, that will be realistic and look right. Having cut your deck piece according to plan, usually in $\frac{3}{16}$ in. or $\frac{1}{4}$ in. wood (sycamore if possible, as this gives the best result), we must shape this to proper camber with a small block plane and glasspaper.

From the Centre

First draw your centre line the whole length of the deck. Working from this, work down each side in a gentle curve to the outside edge, the finished deck to be like section in diagram (B).

In strict scale models it is necessary to work out the correct degree of camber, but this will not be necessary in this case. For small models in Hobbies range, like the Golden Hind, camber your deck to be $\frac{3}{32}$ in. lower at the edges than in the centre. For large models—The Ark Royal, etc.—finish them $\frac{1}{16}$ in. lower at the edges.

Main Deck Only

Do not forget that in most galleon models the main deck piece extends the full length of the hull. Only that part forming the actual main deck should be cambered, otherwise you will have trouble fitting on the upper works correctly.

This done and the deck smoothed nicely with finest glasspaper we must mark out a line around the edges at both

Some Simple and Useful Home Made Tools

IN the making of Ship Models there is much fine and delicate work which can be simplified by the use of the right tools, most of which can be made by the modeller himself at small cost.

The drilling of small parts is but one and drill points of the small number type are not cheap. Moreover, they break very easily. To facilitate this work you need a small watchmaker's pin vice. This will take the finest drill points and is used by twisting between the index finger and thumb, steadying the butt in the palm of the hand.

Drill Points

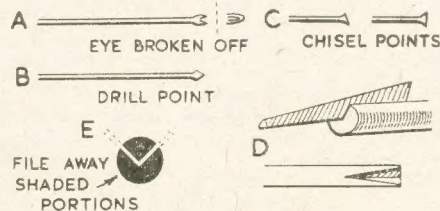
Now to drill points. To make these, first obtain a packet of assorted steel sewing needles. The best cost only a few pence. Commence by breaking off the eye, as in diagram (A) and then sharpen to an arrow point, as in diagram (B). For wood these will not need tempering, but if you propose to use them on metal, temper them by heating red hot and then stick into a bar of common household soap to cool.

Your packet of needles will make several sizes of drill points; I keep one set for wood and another for metal.

Carving

In some models there is a large amount of imitation carving, especially in models of the Stuart period. Why not really decorate such models with real carvings? It is not as difficult as some modellers believe and they rely on roughed-up glue or plastic wood.

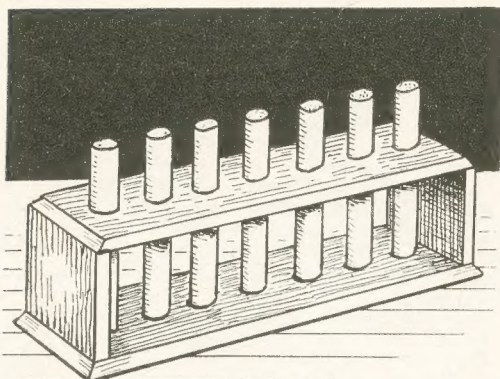
Make yourself a set of miniature



carving tools from darning and sail needles by breaking off the eye as you did for your drill points and grinding to chisel points (as in diagram (C)) on an

(Continued foot of page 410)

For help-yourself occasions you should provide CIGARETTE SERVERS



CIGARETTE 'servers' are very useful things to have at a party or on a dinner table, or indeed at any function where guests are expected to help themselves. They save all the 'digging out' that seems to take place when 'smokes' are supplied in a box or other container, and put the cigarettes more on view. Neatly made servers also are quite attractive items to have about.

Fig. 1 shows a server that is particularly easy to construct. The base is merely a rectangular strip of $\frac{3}{4}$ in. material, 6 $\frac{1}{2}$ ins. by 1 $\frac{1}{2}$ ins. Any good wood will do, or a piece of plywood could be used. Sides and ends of this piece are bevelled for a $\frac{1}{4}$ in. inwards as shown in Fig. 2, and to the extremities are secured the end-pieces (A). These are also $\frac{3}{4}$ in. thick and are 1 $\frac{1}{2}$ ins. by 1 $\frac{1}{2}$ ins.

The Holder Top

Before fitting however, cut the top rectangle (B), which is 5 $\frac{3}{4}$ ins. by 1 $\frac{1}{4}$ ins. and of slightly thinner material than the base. The edges of this piece are also bevelled inward for a little distance. Down the centre are bored seven holes of an easy $\frac{3}{8}$ in. diameter to take the cigarettes. As the diameter of a standard cigarette is $\frac{3}{8}$ in., also it is best to make the holes $\frac{3}{8}$ in. first of all and then enlarge them off a little with a circular file.

The spacing down the centre of (B) is shown in the sketch. Marking $\frac{1}{8}$ in. in from either end of the unbevelled strip and then divide the distance between these two into $\frac{3}{8}$ in. lengths, the division coming out equally. The positions for the holes are then given by the alternate lengths.

The holes in (B) have to agree exactly with part holes in the base, which only go down for $\frac{1}{8}$ in. These lower depressions take the ends of the cigarettes and it is essential that they align perfectly with the corresponding holes above or the cigarettes will not fit perfectly.

Cut Together

A good way to secure accuracy is to fasten the two pieces together temporarily with a couple of fine sprigs and then bore right through till the base is reached, but only marking this. The pieces are then separated and the correct depth obtained in the under strip with a little more careful boring. Getting a similar depth all along is rather important if the cigarettes are to present a good straight line along their top—and it is the even appearance of the cigarettes that gives this server its attractiveness.

Assembly

The four parts now being ready we come to the assembling. The ends are secured to the base with glue and two almost headless sprigs taken up from below which gives strength to the frame should it ever receive a sideways knock. The top (B) is fixed with glue alone.

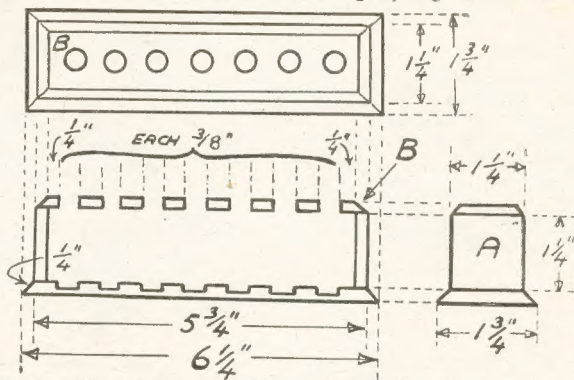
All is now complete and the finish can be according to taste. If good wood has been used polishing alone may suffice. Or stain and polish can be adopted, or again if quickness of completion is desired staining alone will do.

As an added refinement a rectangle of very thin baize (green for preference) should be glued on the under side of the base so that the server can be placed or pushed about on the most highly-polished surface without the danger of doing damage.

In Quantity

In making several servers of this type it is best to keep to the same kind of wood and finish, or alternatively work to a very contrasting finish.

The server as given is for the standard cigarette, but should you require one for the smaller varieties only, i.e. like Woodbines etc. the holes need only be $\frac{5}{16}$ in. diameter—the rest of the dimensions can be the same. In a server made for the larger cigarettes the smaller brands do not look well as they tend to lean over at unsightly angles and so take



Plan and side view of parts, with measurements

away from the general neat appearance.

The making of cigarette servers opens up quite a large field to the imaginative craftsman who will be able to think of a number of possible designs to suit his own special conditions. Details, however, of a more elaborate server will be given in a later article.

Shipmodeller's Corner—(Continued from page 409)

oilstone. With these you can make carvings of your designs in scraps of boxwood or holly, with a little patience and practice.

Have your wood about $\frac{1}{8}$ in. thick and draw your design in pencil first. Even quite a simple carving looks really well when finally painted, gilded and mounted on your model. These tools can also be used for shaping imitation carvings from plastic wood if you prefer this method of reproduction.

Gouges are, of course, a necessity for carving and you can provide small gouges in the same way. Old umbrella ribs cut into short lengths, mounted in a handle of dowel and sharpened, make excellent small gouges.

You can also make a selection of gouges from different sized nails. Mount your nail by tapping it into the dowel handle and then cut off the head with a hacksaw or file. Proceed to file a V groove lengthways in the end of the nail,

using a three-cornered file, as in diagram (D), after which turn the nail over and complete by filing away the waste on each side of your V groove, see diagram (E).

Then sharpen on an oilstone and you have an excellent V gouge for small work, usable also in large models for grooving your plank lines on deck. All chisels and gouges should be mounted in suitable handles made from dowel rods.

'Whipstaff'

Books to Read!

A review of interesting books for craftsmen which have been recently published. Obtainable through newsgagents or book-sellers or direct from the publishers mentioned.

Unforgettable Snapshots

A **S**PLENDID 'bobsworth' for the beginner in photography and one which we can guarantee to produce better results after perusal. No long tedious chapters to read and study; no technical data to work out and memorise. Large actual pictures and small humorous diagrams, with a minimum of essential factual text provide clear concise instructions which are a definite aid to those haphazard users of a camera who so frequently bemoan their inability to get satisfactory pictures. With a book like this improvement is certain, and the learning of it is undertaken lightly-heartedly but with sound technical sense.

Published by Focal Press Ltd., 31 Fitzroy Square, London, W.1—Price 1/-

Inexpensive Television for the Home Constructor

by C. Overland

MANY readers will have pleasant memories of the 1920's when radio was in its infancy and the keenness, pleasure, and excitement we obtained in progressively making cat-whisker crystal sets, one valve, two valve, four valve and then superhet sets. Nobody just buying their radio set today can understand the thrill we got from the building and operation of those home-made tie-ups. And now we have come to a similar stage again apparently, but instead of radio listening sets we have progressed to television. The same opportunity for home built sets is again before the enthusiastic amateur, and from our mail bag interest shown in our regular radio articles we know there will be a great appeal. This new book, therefore, is just what is wanted, for it is a revised and enlarged edition dealing with the construction of receivers from ex W.D. surplus equipment or components which are reasonably easily obtainable. Some technical knowledge is, of course, essential, but apart from the actual instruction on the various sets, a number of addresses are given from which the components are obtainable.

Published by Amalgamated Short Wave Press Ltd., 57 Maida Vale, Paddington, London, W.9—Price 2/6

New Developments in Scale Railway Modelling

by Edward Beal

IT is a pleasure again to have a book by this expert author, because one can always be sure of sound advice, accurate construction and clear details of the

needs of the miniature railway enthusiast. His quarter century experience and the popularity of his previous books prove his reliability and popularity and this new manual will add to his wide circle of friends. The photographs of lay-outs, scenic effects, stations and stock must be an incentive to any keen modeller, whilst the drawings, diagrams and details enable him to imitate and complete with interest and ease. The book has over 300 illustrations in its 268 pages, and is printed and bound on paper and boards which will stand up to the constant reference such a book is sure to have in the hands of keen railway modellers.

Published by A. & C. Black Ltd., Soho Square, London, W.1—Price 15/-

Radio Control for Models

by G. Honnest-Redlich

THREE statements made in the Introduction to this book by the author are, perhaps, surprising, but well worth noting. One is that he gives the 'birthdate' of Radio Control as June 30th, 1905; another is that Radio Control today is no longer solely in the hands of the specialists; and thirdly that

Radio Control is nearly at the point of standardisation. The author is an acknowledged expert himself, but in the book he sets forth his knowledge clearly and easily, so that profound technical understanding is not necessary to find it fascinating and helpful. The book is the first of its kind, deals with the subject clearly, and covers a helpful field where snags have an unhappy knack of occurring. Circuits for transmitters and receivers are shown and explained, with very many photographs of them in use on a variety of occasions, both here and on the Continent. Being a Harborough Publication one can rely on its technical accuracy, clear printing and pictures, and a handsome book to handle and keep for reference.

Published by Harborough Publications, The Aerodrome, Stanbridge, Nr. Leighton Buzzard—Price 8/6

Model Railway Clockwork Mechanisms

by Ernest E. Carter

THE periodical articles in these pages dealing with model railways have, we know, a very wide appeal, and to all

A number of readers have asked about AQUARIUM CEMENTING

AQUARIUM tanks, for the beginner who takes up this very interesting hobby, are divided into three main types. There is the bell jar, the tank with metal frame and glass sides with a base of slate, and the home-made affair made out of a strong wooden box, with glass front.

The metal framed tank is the best, for the glass sides can easily be renewed if broken by accident. You can purchase a welded frame from dealers in aquarist-stores, and fit it with a suitable base of glass or slate. If you can obtain some secondhand plate glass, this will prove very good and economical. A useful size for the beginner is about 18ins. long by 12ins. wide by 18ins. deep.

Waterproof Putty

Many makers of aquariums at home seem to find difficulty in finding a putty that will keep the water from seeping through. Putty for this purpose must be of linseed oil putty, painting the inner sides of the frame and edges of the glass with gold size. Press the glass well home, and clean off all surplus putty with a suitable scraper or knife.

It is, however, better to use a good

cement, a special cement we might add. There are several mixtures that can be used, including the following:

Ten parts by measure of well-sifted dry white sand, ten parts of plaster-of-paris, ten parts of litharge, and two parts of finely powdered or crushed resin. Sufficient boiled linseed oil is needed to mix the ingredients into a fairly stiff kind of 'putty'. To be used as soon as mixed, and you should allow a week or more for the joins to harden.

Variety of Uses

This cement will stick wood, stone, metal, or glass, and hardens thoroughly if left awhile before you put water into the tank. It does no harm to leave it a fortnight to set. It is also useful for marine aquaria, as it resists the action of salt water.

Another useful cement which can be tried is as follows: Six parts of whiting, three parts of plaster-of-paris, three parts of dry white sand, three parts of litharge, and one part of crushed resin. Mix thoroughly into a stiff 'putty', with best oil varnish, and after using leave for a week or ten days to harden before putting water in tank. (256)

those readers interested we can recommend this new small manual on the subject. Mr. Ernest F. Carter has written a number of books, and his extensive knowledge is conveyed in an interesting and non-technical manner. Clockwork, as a driving mechanism, has come to be considered rather 'low-brow', but there is no doubt it is still a reliable motor power for any railway. The usual trouble is, of course, breakages and damage, and that is exactly where this book comes in. Apart from practical information on the subject in general, the owner will be able to undertake his own repairs, and perform necessary running adjustments on his clockwork locomotives with skill and success. That point alone makes the book an economic investment to save a lot of money on repairs and a lot of irritating delays waiting for them to be done. Published by Percival Marshall & Co. Ltd., 23 Great Queen Street, London, W.C.2—Price 3/-

Modern Furniture Projects by W. A. G. Bradman, F.R.S.A.

AS its title suggests the book is a thoroughly up-to-date in concept and constructional advice, covering those comparatively small pieces of furniture to fit modern limited home space. The author (whose work has appeared in *Hobbies Weekly*) has cleverly designed several double-purpose pieces which will particularly appeal to the home handyman who is working out his own planning for home usefulness. There are, for instance, a combined bookcase and lounge table, a floor lamp and cabinet, combination, a firescreen-cum-table, a low workbox-seat and so on. Another excellent point is that early chapters give some particulars of various

prepared boards which can, in certain cases, be substituted for natural wood. The peculiarities and manipulation are shortly given in concise and helpful manner. The author truly maintains that almost any amateur woodworker with a few tools can undertake the work, and successful joints are assured by the early chapters devoted to those used. Processes are clearly shown in the progressive drawings, and having dealt with these, the following chapters deal with many practical everyday pieces of home work. The 182-page book is well printed and a joy to read, with its clear type and simple helpful drawings. Even though the excellent pictures of the finished subjects are rather small, they are clear enough to be attractive. The book can be thoroughly recommended. Published by Herbert Jenkins Ltd., 3 Duke of York's Street, St. James's, London, S.W.1—Price 7/6

Robinson Crusoe Miniature Theatre Puppets

WE have previously reviewed the first of these cardbook cut-out books of popular stories as model theatre plays, and are now pleased to note an addition to the series. The book is large (10½ins. by 8½ins.), of stiff card, printed in bright attractive colours throughout with the figures, script, and even music, for a simple but clever puppet show which can be made and manipulated for the delight of the constructor and the pleasure of any audience. The pantomime story is simple to follow in cutting out and fitting, because helpful diagrams are provided. The figures and scenery are printed full size in colour, for playing out on the theatre stage and front provided. A book worth bearing in

mind to provide unusual entertainment, apart from the pleasure of construction and manipulation.

Published by Medallion Press Ltd., 5 Dowgate Hill, London, E.C.4—Price 3/-

The World's Airways

AIR travel throughout the world has now become so accepted as part of normal civilization that few of us give thought to the amazing advances made—and the organisations necessary to maintain an increasing demand and accident-free performances. The science of air operation has to cover a multitude of details from intricate parts of a 3,500 h.p. engine to a steward knowing the most comfortable way to help you into an overcoat! In this book a dozen experts hand out much of their knowledge in non-technical language so the quite uninitiated can understand and enjoy. The story of all types of machines is a fascinating one, the operation of air lines a source of wonder and amazement, and the explanation of modern jet, turbo-prop and jet-assisted engines provides a sense of pride at the scientific knowledge which produced them. A well-bound book of over 300 pages, with more than 30 explanatory wash drawings and nearly 300 photographs of features of peculiar and human interest to any reader. Whatever your age such a book as this provides delightful, fascinating reading from the foreword by Sir Wm. P. Hildred, C.B., the director general of the International Air Transport Association, to the helpful index at the end of its 320 pages.

Published by Odhams Press Ltd., Book Department, Long Acre, London, W.C.2—Price 8/6

Colour stains, warping, repairs etc. worth knowing in SIMPLE WAYS WITH WOOD

ON the same principle that a stitch in time saves nine, and prevention is better than cure, and a good old thing is better than a shoddy new one, the hints here given are well worth recording.

To obtain BLACK STAIN immerse one pound of iron nails in ½-gallon of vinegar and a small quantity of verdigris, and a good black stain will result. For MAHOGANY STAIN boil ½-pint madder (which is the root of a plant originally, and yields a red dye) with ¼lb. fustic (which is the wood of a West Indian tree and used alone yields a good yellow dye) in one gallon of water. This must be used whilst boiling hot on the wood to be stained, and applied until the desired colour is obtained.

To give wood the appearance of EBONY take one ounce of borax and two ounces of ebony. Put this mixture on the fire in one quart of water. Dissolve until thoroughly mixed, then add one teaspoonful of glue substitute. After

mixing add enough aniline black (soluble in water) after which it is ready for use.

A coloured stain is often required when making lamp-stands, trays etc. and a pretty GREEN STAIN for wood can be obtained by mixing verdigris, sal ammoniac and vinegar and dipping the article to be stained.

The Cheapest Stain

Of course, the cheapest and easiest way of staining wood floors is to dissolve 2 ounces permanganate of potash in warm water, and merely painting the wood evenly with it. The colour may be toned to light or dark oak or walnut according to the amount of water added.

In craftwork it is as well to know exactly what to do to make the best of odd pieces of wood and sometimes a neat patch-up will do the trick. To repair cracks in wood dissolve one part glue in 16 parts water and when nearly cool stir in sufficient quantities of sawdust and prepared chalk in equal quantities to make a paste, and just smooth in the cracks.

Another excellent cement for wood is easily made at home. Powder ½-ounce isinglass between the hands, place in a wide mouthed bottle and dampen thoroughly with acetic acid. Stand the bottle in water and bring to the boil—minus the cork of course. When cold the cement will solidify, but it may easily be melted again by warming when required for use. Be sure to remove the cork when heating.

Sometimes it is unavoidable to make articles without a few marks appearing on the woodwork. An easy-to-make polish is made by heating to simmering point (not boiling), ½-pint linseed oil, then mix whilst hot with ½-gill turps. Apply mixture when cold to the marked wood with a circular movement until the mark disappears.

In craftwork where wood is used the dangers of warping are removed by the following method. Saturate the wood with copaiba balsam; if one side is already warped soak the other side with the liquid. (245)

A PHOTOGRAPHIC ALPHABET

More helpful hints in our practical series. Points the beginner and amateur should know. Look out for further pages.

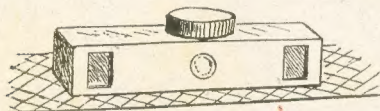
R for—

Range Finder

A RANGE-FINDER is another idea for helping photographers to get their pictures in sharp focus with certainty.

Here we have a small box containing mirrors or prisms set in such a way that when you peep through an eye-piece in the back you see two overlapping images. By turning a knob on the top the images can be made to coincide and if the finder is 'coupled' to the lens this means that the image on the film will now be in pin-sharp focus.

In 'non-coupled' finders, the coinciding of the image gives on a disc the exact distance away of the item in



question, and this reading has to be set on the camera scale in the usual way.

A range-finder can be used separate from the camera and need not necessarily be attached, unless, of course, of the 'coupled' type. The coupled type is really the better, being entirely automatic in action.

Reducers

WHEN a plate or film is dense and heavy and difficult to print from, it can be improved by reduction—a process which makes the deposits on the 'base' thinner.

Reducers can now be bought in tabloid form which is very handy, as each tabloid just makes enough solution for dealing with one or two negatives.

There are several reducers on the market but two main ones should be known by every photographer as they have rather opposite actions. The first is *Farmer's* and this has the effect of first clearing out the shadows, which makes the negative and final print brighter and more contrasty. The second is *Ammonium Persulphate*. This digs into the heavy deposits first and so renders the highlights more transparent without touching the shadows greatly. Thus it tends to even out a too contrasty negative (as well as, of course, reducing it) which is just the opposite effect to *Farmer's*.

The reducers are easy to work, but in both cases action is quick once it starts and the process must be watched carefully. But a little practice with old negatives will soon give the idea.

S for—

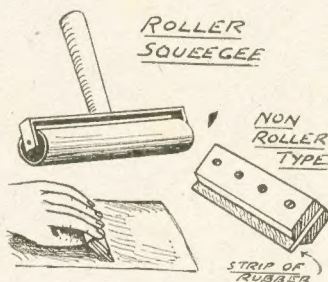
Squeegee

THIS is a very useful photographic accessory and its use is to give an even pressure all over a surface. Thus a squeegee is employed to press prints into good contact with the glazing plate when putting the high gloss on them.

Squeegees can be either of the 'roller' or 'non roller' type. The roller kind, however, are the more popular and one can be made by stretching a length of discarded cycle inner tube over a similar length of round rod (say, from a brush stake) and fitting a simple frame handle.

A non-roller type can be put together by cutting a strip of really thick rubber from, say, an old car tube and fixing this between two rectangles of wood, with just a little of the rubber extending below.

When squeegeeing wet prints on to a glazing plate, the roller should be used in one direction only, i.e., going from one edge to the other, then lifting again. The aim is to squeeze every bit of air from between the print and plate. A



sheet of clean blotting paper must be placed over the prints before applying the roller.

Squeegees have other uses also which make themselves apparent as you try out more and more photographic processes.

Stains

STAINS on gaslight and bromide prints often bother amateurs when they first start to do their own work. These can be anything from a nearly all-over yellow tinge to definite areas of discoloration. The trouble can be caused by several faults in working, the most important being (1) Prints too long in the developer (a very common cause), (2) Stale or overworked developing solution, (3) Too weak hypo, (4) Prints not being quickly immersed in the hypo but left half floating on the surface.

All solutions should be fresh and

exposure so adjusted that the picture always develops up readily without having to 'force' it out. Hypo is cheap, so a new bath should be mixed for each batch of prints, and rinsing water must be kept clean.

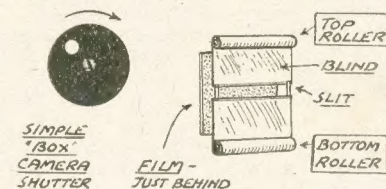
Slight stains can often be removed by placing the affected prints in a dish of water to which a few drops of hydrochloric acid have been added.

Gaslight paper tends to stain more readily than bromide, and so a greater care than usual has to be taken with solution strengths and correct exposure when using this material.

Shutter

THE shutter is the mechanism in a camera which while normally keeping all light from the inside, is capable of being opened for a brief space of time to impress the picture on the film.

Shutters are of two main types: (1) Those set at the front end of the camera near the lens and (2) Focal plane shutters which operate at the back of the



A simple shutter and the focal plane type

instrument right against the plate or film. Most cameras have the former.

With very simple folding and box cameras the shutter is often just a circle of tin rotating on its centre and with an opening on its outer edge. When the trigger is pressed this is twirled through half a revolution by a spring and the picture is taken as the hole passes over the lens, thus for a split second allowing light to pass to the sensitive material.

More expensive cameras have precisely finished and wafer-thin metal vanes which move from the surface of the lens and then close in again.

Focal-plane shutters are simple in action and very efficient. Here a blind of opaque material passes down the face of the film or plate—the nearer the better. In this is a slit from side to side which scans the surface as the blind moves from a top roller to one located at the bottom. Through this slit the picture is taken.

The focal plane shutter is capable of very high speeds, exposure running into thousandths of a second being possible. This kind of shutter is used, therefore, for very exacting action pictures.

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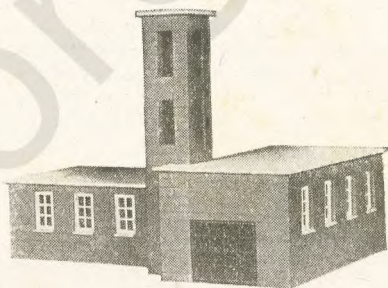
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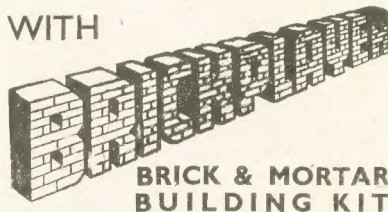
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(Continued foot of page 415)



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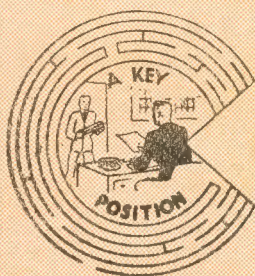


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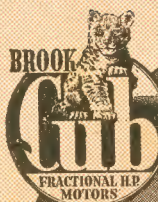
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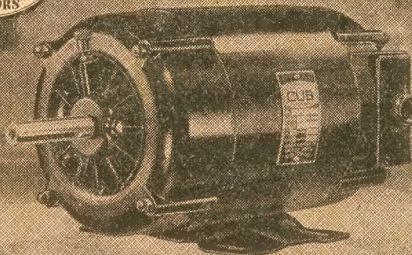
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